Technical Tools for Ecosystem Restoration: Application in Long Island Sound

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Hypoxia is a common occurrence in Long Island Sound bottom waters during the late summer, usually from July through September. It's linked to an overabundance of nitrogen combined with the naturally occurring density stratification of the water column. To address the hypoxia problem, the Long Island Sound Study, a bi-state program sponsored by EPA, has been proceeding with a phased approach to nitrogen reduction. Fifteen years of research, monitoring, modeling, and technical synthesis preceded adoption by EPA in 2001 of a CT-NY total maximum daily load (TMDL) that identified actions needed to attain water quality standards. The TMDL establishes a 58.5% reduction in nitrogen loads to the Sound over a fifteen-year period ending in 2014. The TMDL incorporates flexible and innovative approaches such as "bubble" management zones and exchange ratios for reallocating waste loads to achieve water quality standards. It also highlights the importance of sources of nitrogen from outside of the NY and CT portions of the watershed, such as atmospheric deposition and tributary import.

This presentation will highlight the key technical challenges to:

- estimating pollutant discharges from the 16,000 square mile watershed
- relating those discharges to water quality impairments in Long Island Sound
- estimating the potential to control those pollutant discharges
- developing dissolved criteria for marine organisms
- understanding and estimating the ecological benefits of improved water quality on living resources
- estimating costs of control strategies
- using all of the above, developing a cost-effective management approach to address the problem

The roles of EPA Regions 1 and 2, EPA-ORD, the states of New York and Connecticut, and other technical partners will be presented.